



July 14, 2017

Via electronic mail and US Mail

Central Valley Regional Water Quality Control Board

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Fresno, CA 93706

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Cc: Joshua.Mahoney@waterboards.ca.gov

**Re: Tentative Order Amending Waste Discharge Requirements Order
R5-2015-0127**

Dear Sir/Madam:

I am writing on behalf of the Center for Biological Diversity and its members to submit the following comments regarding the Central Valley Regional Water Quality Control Board (Regional Water Board) Tentative Order to Amend the Waste Discharge Requirements (WDR) for California Resources Corporation (CRC). The Regional Water Board proposes adding two provisions to the existing requirements under WDR Order R5-2015-0127. We believe the requirements, even when including the proposed amendments, are grossly inadequate to ensure that the area's water, air, wildlife, agriculture, and public health are protected, and urge the Regional Board to rescind this phase out these dangerous wastewater disposal practices. In particular, to the extent the WDR Order purports to allow discharge of wastewater from stimulated wells onto land, this practice is illegal under state law and must be clearly prohibited by the WDR.

I. Oil Industry Wastewater Should Not Be Used for Irrigation

A. Known Constituents of Wastewater Are Harmful to Human Health

Oil industry wastewater contains constituents that are known to be carcinogenic or otherwise harmful to human health. A study by the Division of Oil, Gas, and Geothermal Resources (DOGGR) found that produced water can contain as much as 18 parts per million of benzene, a known carcinogen.¹ That is 18,000 times the state maximum contaminant level for benzene-- California has determined that 1 µg/L of benzene can increase the risk of adverse health impacts.² By comparison, CRC's wastewater contains 1.2 µg/L benzene levels above the state's

¹ DOGGR, *Benzene in Water Produced from Kern County Oil Fields Containing Fresh Water* (1993).

² 22 Cal. Code Reg., § 64444, Table 64444.

maximum contaminant level for drinking water—20% above the state limit for drinking water.³ Moreover, that concentration datum was based on a single sample of wastewater from CRC’s wastewater stream.⁴ Though CRC’s wastewater will sometimes be blended with other sources of water in an effort to lower concentrations of harmful constituents, blending does not always occur. CRC may discharge “as much as 1,740 ac-ft” during a time with blending does not occur.⁵ Worse still, the WDR has no measurements for other harmful chemicals that may be a part of CRC’s wastewater. For example, other “BTEX” chemicals—ethylbenzene, toluene, and xylene—are not tested, and the WDR does not call for their testing. Without more information, the Regional Water Board is potentially exposing the public to chemical constituents that lead to adverse health consequences.

The WDR does not disclose the full array of chemicals that are present in oil industry wastewater, nor does it require CRC to fully report which chemicals it uses in its oil extraction activities and what constituents are in its wastewater.

A recent study shows that routine oil and gas operations such as drilling, completion, and extraction processes, use hundreds of chemicals as solvents, biocides, polymers, surfactants, corrosion inhibitors, and lubricants even in routine operations.⁶ Many of these are considered harmful to human health. They study found that 22 chemicals were listed on the California Toxic Air Contaminant List; 12 were listed on the Proposition 65 list; 10 were on the US EPA’s Drinking Water Standards and Health Advisory List; six were present on the U.S. EPA Contaminant Candidate List 4; three were on the European Chemicals Agency Substance of Very High Concern Candidate List; and two were on the OSPAR List of Substances of Possible Concern.⁷

In addition, a large portion of chemicals were not identified or had no associated studies to determine their impacts to human health and the environment. A full 44 percent of chemicals that were identified in the study had no information regarding their toxicity, mass data or CASRN.⁸ Moreover, oil companies often withhold information regarding chemical use under dubious claims of trade secrecy, further hindering the ability of the public and regulators from knowing the true extent of risks posed by oil and gas activity.

California has already experienced water quality degradation and contamination due to oil industry wastewater disposal. According to an independent scientific study on California’s oil and gas practices, a panel of scientists noted that “this practice provides a direct pathway for the transport of produced water constituents, including returned stimulation fluids, into

³ R5-2015-0127, p. 4

⁴ Ibid. (“The results for benzene, naphthalene, and total petroleum as crude oil are from one sample collected in April 2015.”)

⁵ WDR R5-2015-0127, p. 5

⁶ Stringfellow WT, Camarillo MK, Domen JK, Shonkoff SBC (2017) Comparison of chemical use between hydraulic fracturing, acidizing, and routine oil and gas development. PLoS ONE 12(4): e0175344. <https://doi.org/10.1371/journal.pone.0175344>

⁷ Stringfellow at p. 15.

⁸ Stringfellow at p. 11.

groundwater.”⁹ The Regional Water Board also confirmed: “degradation of ground water from oil field wastewater disposal occurred in some areas.”¹⁰

The study found that “[t]here is ample evidence of groundwater contamination from percolation pits in California and other states. For example, in California, the Central Valley Regional Water Quality Control Board determined that several percolation pits in Lost Hills and North and South Belridge had impacted groundwater, and ordered their closure.”¹¹

Due to the inherent danger of this type of wastewater disposal, the study recommended that, “If the presence of hazardous concentrations of chemicals cannot be ruled out, [responsible agencies] should phase out the practice of discharging produced water into percolation pits.”¹² The practice of disposing wastewater into pits has been phased out in some states, including Kansas, Texas, and Ohio.

The environmental harm caused by disposal via pits and sumps also applies to groundwater recharge and irrigation. The same dangers posed by the contaminants in wastewater are present regardless of the method of disposal. Given these risks and documented instances of water contamination, the Regional Water Board’s WDR offers inadequate protections for water quality.

B. The State Is Currently Studying the Safety of Reusing Produced Water for Irrigation

The Regional Water Board should not allow wastewater to be used for irrigation without first studying the potential adverse effects on agriculture and human health and safety.

Recently, the Regional Water Board formed an expert panel to guide a study of the safety of using oil industry wastewater to irrigate crops in the Central Valley. The first phase of the study aims to identify and further evaluate “chemicals that 1) may be at ‘high’ or detectable levels in irrigation water, 2) are chronically toxic to humans, and 3) may be taken into plants, in particular edible portions of the plant.”¹³

The study will also incorporate a literature review on produced water and reuse in agriculture and the potential occurrence of chemical additives and petroleum-associated contaminants in food crops.¹⁴

In addition, the study will conduct tests on samples of various crops in an effort to determine whether certain constituents from wastewater are present in crops when irrigation is supplied by wastewater streams.¹⁵

⁹ California Counsel of Science and Technology, An Independent Scientific Study of Well Stimulation in California, Vol. II, July 2015 (“CCST Report”) at p. 110.

¹⁰ Basin Plan, IV-14.

¹¹ Id. (internal citations omitted).

¹² CCST Report at p. 25

¹³ Regional Water Board, Scope of Work Draft Plan, Attachment 1 (June 2017), available at http://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/food_safety/meetings/2017_0628_fs_scopeofwork.pdf

¹⁴ Ibid.

The results of this initial assessment may take a year or longer. In the meantime, the Regional Water Board should not allow oil field wastewater to be used on crops.

II. The Waste Discharge Requirements Are Inconsistent with Water Protections

Under the Water Quality Control Plan for the Tulare Lake Basin (the Basin Plan), “Protection and enhancement of beneficial uses of water against quality degradation is a basic requirement of water quality planning under the Porter-Cologne Water Quality Control Act. In setting water quality objectives, the Regional Water Board must consider past, present, and probable future beneficial uses of water.”¹⁶ Oil industry wastewater disposal is inconsistent with the Tulare Lake Basin Plan, which requires that “[w]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.”¹⁷ It further states:

Controllable factors are not allowed to degrade water quality unless it is demonstrated that degradation is consistent with maximum benefit to the people of the State. In no cases may controllable water quality factors unreasonably affect present and anticipated beneficial uses of water nor result in water quality less than that prescribed in water quality control plans and policies. In instances where uncontrollable factors have already resulted in water quality objectives being exceeded, controllable factors are not allowed to cause further degradation of water quality. The Regional Water Board recognizes that manmade changes that alter flow regimes can affect water quality and impact beneficial uses.¹⁸

The Basin Plan also requires that “[w]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.”¹⁹ Further, “All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.”²⁰ This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.”²¹

Oil industry wastewater has already proven to be unsafe and the cause of degradation in the region and thus conflict with the Basin Plan. As stated above, multiple chemicals identified as wastewater constituents are known to have detrimental physiological responses in human, plant, animal, and aquatic life. Thus allowing wastewater to be discharged in the manner proposed would run afoul of the Basin Plan’s water quality protections.

¹⁵ Ibid.

¹⁶ Water Quality Control Plan for the Tulare Lake Basin, Second Edition (Basin Plan) (2015), P. II-1; Water Code § 13241.

¹⁷ Basin Plan, III-3.

¹⁸ Basin Plan, III-1-2.

¹⁹ Basin Plan, III-3.

²⁰ Basin Plan, III-6.

²¹ Ibid.

Separately, the State Water Resources Control Board (State Water Board) Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Anti-degradation Policy) requires that, wherever the existing quality of surface or ground waters is better than the objectives established for those waters, the existing quality will be maintained unless as otherwise provided by Resolution No. 68-16 or any revisions thereto.

III. Discharging Wastewater Originating from Wells that Have Undergone Well Stimulation Is Dangerous and Illegal

The WDR is unclear whether wastewater generated from wells that have undergone well stimulation may be reused for irrigation or disposed of onto land for groundwater recharge. This is both dangerous and illegal under current law.

Under the California Code of Regulations, “produced water from a well that has had a well stimulation treatment ... *shall not be stored in sumps or pits.*”²² The Division of Oil, Gas, and Geothermal Resources (DOGGR) reiterated, “Storage *or disposal* of well stimulation fluids in sumps or pits are [sic] prohibited by the permanent SB 4 regulations.”²³ DOGGR has also stated in publicly filed court documents that “DOGGR’s permanent regulations now *prohibit* the “historical impoundments” of wastewater in disposal pits.”²⁴

The risk of water contamination may increase when the wastewater originates from wells that have undergone well stimulation treatments in the past. The CCST Report notes, “the presence of stimulation fluids in the produced water is likely to increase the risk of groundwater contamination.”²⁵

As drafted, the WDR may be interpreted to allow wastewater from wells that have undergone well stimulation to be discharged into or stored in pits or sumps if they are part of a groundwater recharge process, which would constitute a direct violation of state regulations. Provision E.13 states,

The Discharger shall submit an [sic] Report of Waste Discharge at least 90 days prior to discharging produced water from any well that has either been subject to a “well stimulation treatment” (as defined by Cal. Code Regs., tit. 14, § 1761, including hydraulic fracturing, acid fracturing, and acid matrix stimulation)....

[T]he Executive Officer shall make a determination as to whether the discharge of such produced water is considered a “material change in the character of the discharge” such that the Board must modify these WDRs, or whether the discharge may commence pursuant to this Order.²⁶

²² 14 Cal. Code Reg. § 1786(a) (emphasis added.)

²³ DOGGR, Senate Bill 4 Environmental Impact Report (July 2015) at 10.14-84 [citing 14 Cal. Code Reg. § 1786(a)(4)]

²⁴ *Center for Biological Diversity v. DOGGR* (Sacramento County Sup. Ct. 2016) Case No. 34-2015-80002149 (DOGGR, Opposition to 1st Amended Petition (July 13, 2016))

²⁵ CCST Report at p. 113.

²⁶ R5-2015-0127, p. 22

This provision fails to reflect state law that prohibits wastewater discharge onto land from any well that has undergone well stimulation treatment. Neither the Executive Officer nor the Board has the authority to grant approval for such discharges. The provision is also inconsistent with the Information Sheet for Order R5-2015-0127, which states that “Discharge Prohibition A.4 prohibits the discharge to land of any fluids from wells that have undergone a ‘well stimulation treatment,’ as defined by [citation] is prohibited [sic].”²⁷ It should be noted that the reference to Discharge Prohibition A.4 does not appear to align with the publicly available version of R5-2015-0127. The cited section reads, “Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Water Code section 13050” and does not contain a reference to well stimulation.²⁸

The Information Sheet also states that “Discharge [Prohibition] A.5 prohibits the discharge of fluids associated with the frac-packing process ... to land.”²⁹ Looking at Prohibition A.5, it states that discharge of “hazardous” wastes is prohibited, but does not mention frac-packing specifically, nor does Prohibition A.5 contain an exemption for drilling muds mentioned in the Information Sheet.

The provision should be amended to state clearly that wastewater from stimulated wells may not be discharged onto land. It should also include a provision that wastewater from stimulated wells may not be used for irrigation. This is the fourth instance in recent months in which the Regional Water Board has attempted to legitimize the illegal practice of discharging wastewater from post-stimulation wells.³⁰ We strongly urge the Regional Water Board to stop this illegal practice as mandated by state law.

IV. The Proposed Amendments Are Inadequate to Protect Wildlife and Water Quality

The proposed amendments, adding Section C.9 and E.14, are inadequate to protect wildlife and water quality.

Proposed Amendment C.9 would require that CRC wastewater be “free of visible oil or oil accumulation or effectively netted to preclude the entry of wildlife.” This provision appears to assume that wastewater with no visible oil is safe for wildlife, but this is not the case. The Regional Water Board offers no evidence that wastewater with no visible oil would be safe. To the contrary, many of the chemical constituents of wastewater may have significant adverse effects on wildlife even when not visible.³¹ Netting should be required in every instance in which wildlife may be exposed to wastewater. In addition, the proposed amendment does not define what constitutes wastewater that is “effectively netted” or who decides what is effective.

²⁷ Information Sheet, Order No. R5-2015-0127, p. 8.

²⁸ R5-2015-0127, p. 18.

²⁹ Information Sheet, Order No. R5-2015-0127, p. 8.

³⁰ See General Orders 1, 2, and 3 for Discharges of Wastewater onto Land, adopted April 6-7, 2017.

³¹ Stringfellow at p. 11 [noting that 13 chemicals used in oil and gas operations have been found to have mammalian toxicity, and a “wide range” of chemicals showing aquatic organism toxicity.]

The visibility of oil does not determine whether the wastewater is safe for reuse as irrigation or for groundwater recharge. The WDR should incorporate requirements that will allow for such disposal practices if proven safe for human health and the environment.

As the Basin Plan explains, “In nearly all cases, preventing pollution before it happens is much more cost-effective than cleaning up pollution after it has occurred. Once degraded, surface water is often difficult to clean up when it has passed downstream. Likewise, cleanup of ground water is costly and lengthy due, in part, to its relatively low assimilative capacity and inaccessibility. The prevention of degradation is, therefore, an important strategy to meet the policy’s objectives.”³²

Here, the wastewater may lead to degradation if disposed of in the manner proposed by the Regional Water Board. Moreover, the extent of harm is unknown given that there has been no comprehensive disclosure of the chemicals present in the wastewater being discharged. Without complete information, the public and the Regional Water Board are left in the dark as to the true impacts of this Order.

The amendment to Provision E.14 requires the Discharger to comply with the Oil Field Wastewater Provisions of the Basin Plan.³³ The amendment should clarify that the Discharger must comply with all applicable sections of the Basin Plan, not just the Oil Field Wastewater provisions. For example, operators are legally obligated to adhere to requirements pertaining to water quality objectives for groundwater, chemical constituents, erosion, well standards, overdraft, reclamation, discharges to land, hazardous and non-hazardous waste disposal, and anti-degradation. The Discharger is also subject to the State Water Board’s Anti-Degradation Policy.

V. The Regional Water Board Must Put Stronger Protections in Place.

Given the known risks of oil industry wastewater and the breadth of information that is yet unknown about the true extent of potential harm that may result from these dangerous discharge practices, the Regional Water Board has an obligation to the public to reassess how it regulates the oil and gas industry. The Regional Water Board should not allow wastewater to be used as irrigation until the expert panel has had the opportunity to thoroughly evaluate the risks of exposure to harmful chemicals that may result from these discharges.

The Regional Water Board should also require full and timely disclosure of all chemicals used in the oil and gas development process, with no protections granted for trade secrecy. It should also order that a full chemical analysis be conducted for any wastewater disposed of in the manner described in this Order. The existing metrics used to evaluate the quality of wastewater—electrical conductivity, salinity, boron, chloride, oil and grease, and arsenic—do not cover the numerous harmful chemicals that may also be present.

³² Basin Plan IV-20.

³³ It is unclear whether the proposed amendment to E.14 has the effect of deleting the preexisting provision, which states, “The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.” (Order R5-2015-0127, p. 22.)

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Hollin Kretzmann", written over two horizontal lines.

Hollin Kretzmann
Staff Attorney, Climate Law Institute
Center for Biological Diversity

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References Enclosed